Candidate Name	Centre Number					Candidate Number				
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GCSE

CHEMISTRY

UNIT 3: PRACTICAL ASSESSMENT

SAMPLE ASSESSMENT MATERIALS

INVESTIGATING THE REACTION BETWEEN ZINC AND COPPER SULFATE SOLUTION

SECTION A

(1 hour)

For Examiner's use only		
	Maximum Mark	**Mark Awarded**
Section A	**6**	

ADDITIONAL MATERIALS
In addition to this paper you will require a calculator.

INSTRUCTIONS TO CANDIDATES
Use black ink or black ball-point pen.
Write your name, centre number and candidate number in the spaces at the top of this page.
Write your answers in the spaces provided in this booklet.

INFORMATION FOR CANDIDATES
The total number of marks available for this section of the task is 6.
The number of marks is given in brackets at the end of each question or part question.
This task is in 2 sections, **A** and **B**. You will complete section **A** in one session and section **B** in the next session.

SECTION A

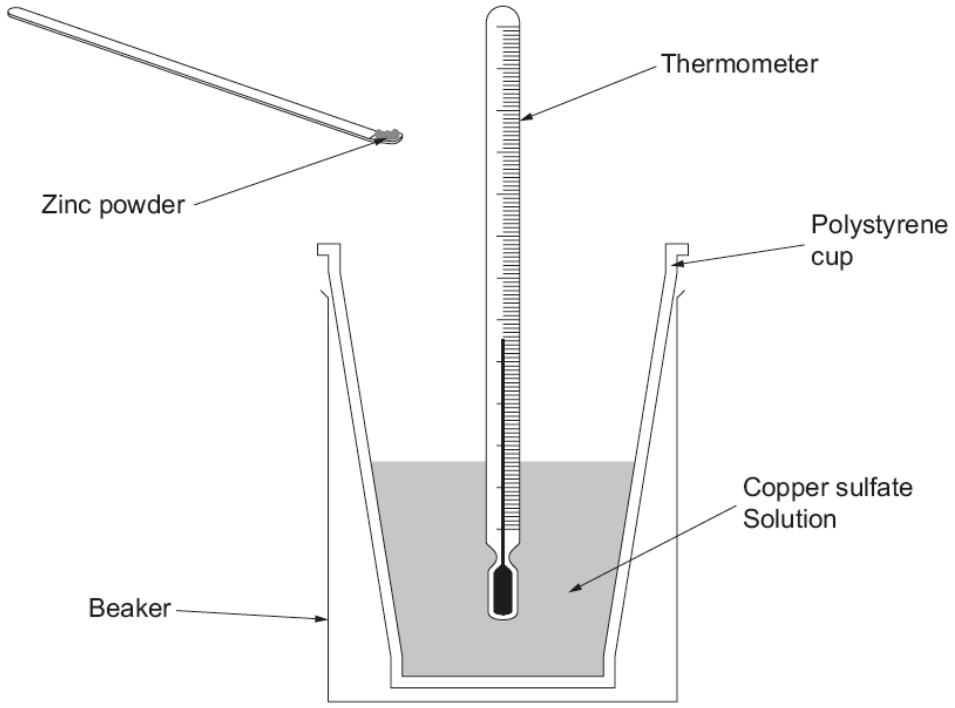
Introduction

Your task is to investigate the reaction between zinc and copper sulfate solution.

Apparatus

The following apparatus is required for each group:
(each group should consist of no more than three candidates)

- Polystyrene cup
- 100 cm^3 measuring cylinder
- 250 cm^3 beaker
- Safety goggles
- 50 cm^3 0.5M copper sulfate
- Zinc powder
- Microspatula



Read the method and answer question 1(a) before carrying out the experiment and recording your results.

Method:

1. Measure 50 cm^3 of copper sulfate into the polystyrene cup.
2. Stand the cup in a beaker to keep it stable.
3. Measure the initial temperature of the copper sulfate solution.
4. Add 1 microspatula of zinc powder to the copper sulfate solution and stir.
5. Measure and record the highest temperature reached by the mixture.
6. Calculate the temperature rise compared to the original temperature.
7. Repeat steps 4 - 6 until a total of 8 microspatulas of zinc powder have been added to the copper sulfate solution.
8. Repeat steps 1 to 7 to gain two sets of results in total.

Answer **all** *questions*

1. (a) Copper sulfate and zinc powder are irritants. Complete the risk assessment for copper sulfate using the template set out below. [1]

HAZARD	RISK	CONTROL MEASURE
Copper sulfate is an irritant/ harmful		

You may record raw results in the space below.

(b) Present your results in a table, including all of your results and the mean temperature rise for each spatula added. [5]

6

END OF PAPER

Candidate Name	Centre Number					Candidate Number				
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GCSE

CHEMISTRY

UNIT 3: PRACTICAL ASSESSMENT

SAMPLE ASSESSMENT MATERIALS

INVESTIGATING THE REACTION BETWEEN ZINC AND COPPER SULFATE

SECTION B

(1 hour)

For Examiner's use only		
	Maximum Mark	**Mark Awarded**
Section B	**24**	

ADDITIONAL MATERIALS
In addition to this paper you will require a calculator and your section **A** exam paper.

INSTRUCTIONS TO CANDIDATES
Use black ink or black ball-point pen.
Write your name, centre number and candidate number in the spaces at the top of this page.
Write your answers in the spaces provided in this booklet.

INFORMATION FOR CANDIDATES
The total number of marks available for this section of the task is 24.
The number of marks is given in brackets at the end of each question or part question.
This task is in 2 sections, **A** and **B**. You will have completed section **A** in a previous session.

SECTION B

Answer **all** *questions*

2. (a) (i) Identify the independent and dependent variables in the experiment completed in section A. [2]

independent variable: ……

dependent variable: ……

(ii) State **two** controlled variables from the method used in section A and give the value for each. [2]

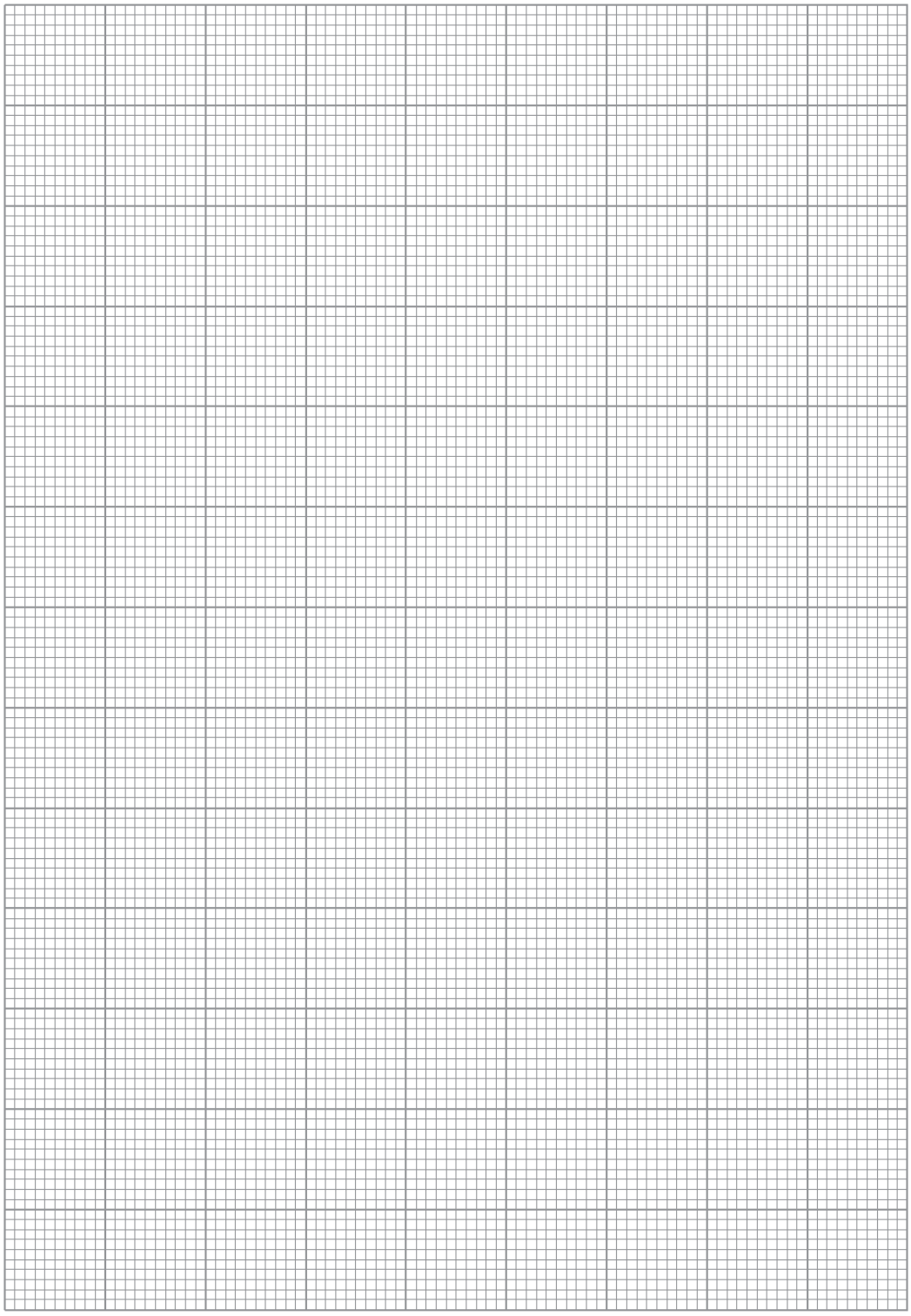
Controlled variable 1 ……..

value ……..

Controlled variable 2 ……..

value ……..

(b) Use your results from section A to draw a graph on the grid below. [5]



(c) Use your graph to describe the relationship between the quantity of zinc added and the temperature change. [2]

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(d) Why is a polystyrene cup used to carry out the experiment? [1]

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(e) (i) How could you change the apparatus/method used to ensure that the maximum temperature change was achieved? [2]

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(ii) Identify **two** inaccuracies in the method and suggest an improvement for each. [4]

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(f) What is the name given to a reaction in which heat energy is given out? [1]

……

(g) What happens in terms of energy changes during the reaction that causes the temperature to rise? [2]

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(h) Using the formula given below, calculate the maximum energy released during your experiment. [3]

$E = mc\Delta T$

where:

E = Energy released (J)

m = mass of solution used (1 cm^3 = 1 g)

c = specific heat capacity = 4.18 J/g °C

ΔT = temperature change ($T_{maximum}$ - $T_{initial}$)

energy released = ...J

24

END OF PAPER